*Figure 10.6 - Determining available water capacity (AWC)

Field Procedure for Estimating Available Water Capacity

1. Identify the horizons present in the soil profile.
2. Measure the thickness of each horizon.
3. Determine the effective depth of rooting.
4. For each horizon:
   a. Determine the texture and the rock fragment (2 mm-25cm) content.
   b. Find the percent fine earth by subtracting:
      100% - percentage rock fragment content = percent fine earth.
   c. Use the AWC rate that corresponds to the texture of each horizon.
   d. Multiply the AWC rate by thickness of horizon by percent fine earth to determine the AWC.
5. Total the AWC for all horizons within the effective rooting depth.
6. Determine the correct AWC class.

Soil Texture	AWC Rate in Inches of Water/Inch of Soil	AWC Class (Rates to 60 in.)
Sand, loamy sand	.06	Very low -- < 3 in.
Sandy loam	.12	Low -- 3 - 6 in.
Loam, silt loam	.22	Moderate -- 6 - 9 in.
Silty clay loam, clay loam	.17	High -- 9 - 12 in.
Silty clay, sandy clay	.12	Very high -- 12 in.
Sandy clay loam	.15	
Clay	.09	

Table 10.5 - Guide for Internal Drainage and Depth to WT

Drainage Class	Mottles	Depth to WT
Excessive (E)/ Somewhat excessive (SE)	No gray colors or mottles	> 6 ft
Well (W)	Gray mottles below a depth of 42 in. or more	> 3.5
Moderately well (MW)	Gray mottles at depths of 24-40 in.	2 - 3.5 ft
Somewhat poorly (SP)	Gray mottles below the A horizon	1 - 2 ft
Poorly (P)		0 - 1 ft
Very poorly (VP)	Gleyed colors or gray mottles to the surface, depressional areas, and evidence of long periods of ponding	+ 1 ft

Table 10.4 - Guide for Determining Soil Permeability

Texture	Permeability (inches of water/hour)
Sand, loamy sand	Rapid and very rapid (>6.0 in/hr)
Sandy loam	Moderately rapid (2.0 - 6.0 in/hr)
Loam, silt loam	Moderate (0.6 - 2.0 in/hr)
**** Sandy clay loam	Moderately slow (0.2 - 0.6 in/hr)
**** Clay loam, silty clay loam	Moderately slow (0.2 - 0.6 in/hr)
**** Sandy clay	Moderately slow (0.2 - 0.6 in/hr)
**** Silty clay, clay	Very slow and slow (< 0.2 in/hr)
***NOTE:** If the horizon is a fragipan, use the guide below.*	
Fragipan (weak)	Slow (0.6 - 0.06 in/hr)
Fragipan (strong)	Very slow (< 0.06 in/hr)
****NOTE:** If the horizon is Kaolinite/Sandy clay loam; Clay loam, silty clay loam; Sandy clay; or Silty clay, clay use the Structure and Permeability to the right.*	Moderate (0.6 - 2.0 in/hr)
	For subsoil permeability, use permeability of most limiting layer (between the base of the surface layer to a depth of 60 inches excluding the CR and R horizons).

Table 13.2 - Guide for Determining the Shrink-Swell Potential

Use thickest layer (10 to 60 inches) Dominant % of Material

Soil Texture	Percent Clay	Shrink-Swell Rating
Sand, loamy sand, sandy loam, loam, silt loam	0 - 26.99%	Low
** Silty clay loam, clay loam, sandy clay loam	27 - 39.99%	Moderate
*** Silty clay, clay, sandy clay	> 40%	High

** Kaolinite/Silty clay loam, clay loam, sandy clay loam use Low Shrink-Swell Rating
*** Kaolinite/Silty clay, clay, sandy clay use Moderate Shrink-Swell Rating

*Table 10.3 - Permeability Class

Permeability Class	Water Flow in saturated soil (in/hr)
Very rapid	> 20.0
Rapid	6.0 - 20.0
Moderately rapid	2.0 - 6.0
Moderate	0.6 - 2.0
Moderately slow	0.2 - 0.6
Slow	0.06 - 0.2
Very slow	.01 - .06
Extremely slow	<0.01

INTERPRETATION HELP SHEET (Revised 2003)

* Figure or Table has been adjusted and may not match the IML curriculum guide and student handbook.

Figure 12.1 - Guide for determining artificial surface drainage

Drainage is needed for:

1. Soils that are somewhat poorly drained, poorly drained or very poorly drained, and are nearly level with depressional spots.

2. Sloping soils below seepy areas.

Table 12.1 Irrigation Guidelines

Soil Characteristic	Asset	Liability
Surface Soil Texture	Loam, silt loam, silty clay loam, clay loam	All Other Textures
Slope	0 - 3%	> 3%
AWC	> 6 in	0 - 6 in
Depth to High WT	> 2 ft	0 - 2 ft
Permeability	> 0.2 in/hr	< 0.2 in/hr
Rock Fragments >3 in (surface layer)	< 15%	> 15%
Depth	> 40 in	0 - 40 in

Table 12.2 - Guide for Determining Hazards or limitations for Cropping

Possible Hazard or limitation	Soil Characteristics That Indicate A Hazard or Limitation Exists
Slope or Erosion	1. All land slopes longer than 90 ft in excess of 2% slope. 2. Any eroded area where the upper 6-7 in is either mixed topsoil and subsoil, mostly subsoil, or has gullies.
Available Water Capacity	Less than 10 in of available water in the upper 60 in of the profile.
Surface Drainage	High water table <2 ft and nearly level with depressional spots. Also, sloping areas below seep spots.
Internal Drainage	High water table <3.5 ft.
Rock Fragments (volume upper 10 in)	>15%
Stoniness (surface)	Stones <100 ft apart
Rockiness	10 sq. ft. of rock outcrop per 10,000 sq. ft. of area

INTERPRETATION HELP SHEET
Revised 2003

Table 13.1 - Guide for Rating Limitations for Pond Reservoir Area

For subsoil permeability, use permeability of most limiting layer.

Property	Slight	Moderate	Severe
Permeability	<0.6 in/hr	0.6 - 2.0 in/hr	>2.0 in/hr
Depth to hard bedrock	> 60 in	20 - 60 in	< 20 in
Depth to soft bedrock	> 60 in	20 - 60 in	< 20 in
Slope	< 3%	3 - 8%	> 8%

Table 13.3 - Guide for Rating Limitations for Dwellings with Basements

Property	Slight	Moderate	Severe
Depth to WT	> 6.0 ft	2.5 - 6.0 ft	< 2.5 ft
Flooding	None	---	Any flooding
Shrink-Swell (thickest layer 10-60 in)	Low	Moderate	High
Slope	< 8%	8 - 15%	> 15%
Rock Fragments (percent >3 in) (avg. percent volume to a depth of 40 in)	< 15%	15 - 35%	> 35%
Depth to Bedrock	> 60 in	40 - 60 in	< 40 in

Table 13.4 - Guide for Rating Limitations for Septic Tank Absorption Fields

Use most limiting layer in (24-60 inches).

Property	Slight	Moderate	Severe
Permeability (24-60 in)	2.0-6.0 in/hr	0.6-2.0 in/hr	<0.6 or >6 in/hr
Depth to WT	> 6 ft	4 - 6 ft	< 4 ft
Depth to Bedrock	> 60 in	40 - 60 in	< 40 in
Slope	< 0 - 8%	8 - 15%	> 15%
Flooding	None	---	Any flooding
Rock Fragments >3 in (avg. percent volume to a depth of 40 in)	< 15%	15 - 35%	> 35%

Table 13.5 - Guide for Rating Limitations for Sewage Lagoons

For subsoil permeability, use permeability of most limiting layer.

Property	Slight	Moderate	Severe
Permeability	< 0.6 in/hr	0.6 - 2.0 in/hr	> 2.0 in/hr
Slope	< 2%	2 - 8%	> 8%
Flooding	None	---	Any flooding
Depth to WT	> 5 ft	3.5 - 5 ft	< 3.5 ft
Depth to Bedrock	> 60 in	40 - 60 in	< 40 in
Rock Fragments >3 in(avg. % volume to a depth of 40 in)	< 15%	15 - 35%	> 35%